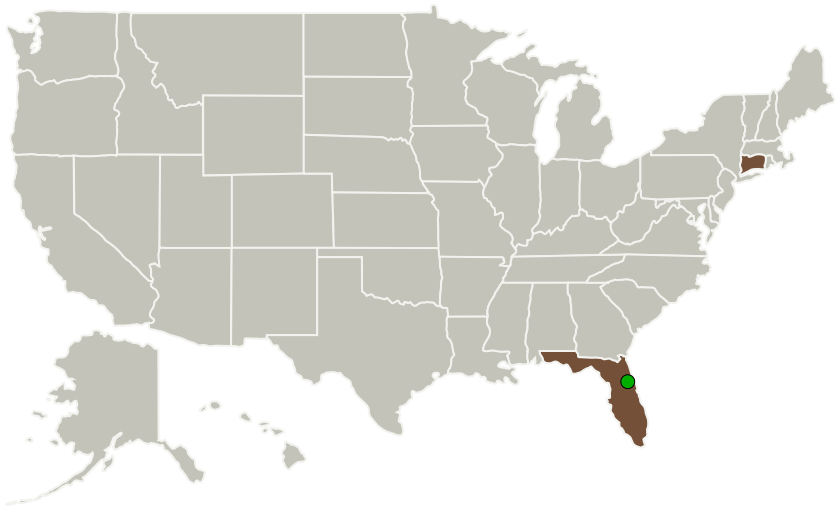
Regenerable Trace-Contaminant Sorbent for the Primary Life Support System (PLSS), Phase I

Completed Technology Project (2011 - 2011)

Project Introduction

The NASA objective of expanding the human experience into the far reaches of space requires the development of regenerable life support systems. This proposal addresses the development of a regenerable air-revitalization system for trace-contaminant (TC) removal for the space suit used in Extravehicular Activities (EVAs). The proposed innovations are: (1) a carbon monolith sorbent, in contrast to the currently used bed of granular charcoal; (2) carbon pore structure tailored for optimal vacuum/thermal regeneration; (3) resistive heating of the carbon monolith for rapid regeneration; (4) low pressure drop; and (5) good resistance to dusty environments. The overall objective is to develop a trace-contaminant control system that is regenerable and that possesses substantial weight, size, and power-requirement advantages with respect to the current state of the art. The Phase 1 objectives are: (1) to demonstrate the technical feasibility of using a novel monolithic carbon sorbent for trace-contaminant control; and (2) to demonstrate effective ammonia capture and sorbent regeneration. This will be accomplished in three tasks: (1) Preparation and Characterization of Carbon-Sorbent Monoliths; (2) Sorbent Testing; and (3) Product Assessment.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Advanced Fuel Research, Inc.	Lead Organization	Industry	East Hartford, Connecticut
Kennedy Space Center(KSC)	Supporting Organization	NASA Center	Kennedy Space Center, Florida

Primary U.S. Work Locations	
Connecticut	Florida

Project Transitions

February 2011: Project Start

September 2011: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138456)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Advanced Fuel Research, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

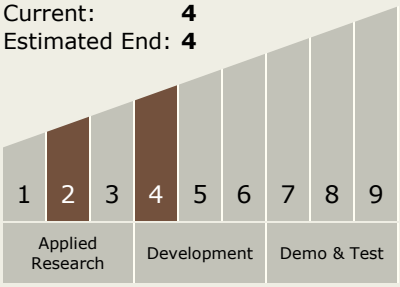
Carlos Torrez

Principal Investigator:

Marek Wojtowicz

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.2 Extravehicular Activity Systems
    - TX06.2.2 Portable Life Support System

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System